

NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Encapsulation Process Sterilizes and Preserves Surgical Instruments

The problem: To develop a process for sterilizing surgical instruments in an encapsulating material that will preserve them in a sterile condition for indefinite periods. The process should not require autoclaving with steam, and the encapsulating material must be readily removable when the instruments are needed for use.

A possible solution: A process of blending ethylene oxide, which serves as a sterilizing agent, with an organic polymer to form a sterile encapsulating material that does not bond to metal.

How it's done: Ethylene oxide, in the gaseous or liquid state, is mixed with an appropriate plasticizer and uncured polymeric material that do not chemically react with the ethylene oxide. The instruments are dipped into a thin solution of the mixture to encapsulate them and then removed for vacuum degassing and subsequent curing of the adherent film. Sterilization of the instruments occurs during the degassing and curing process. In this process, most of the ethylene oxide and other residual gases are liberated from the mixture, and all surfaces of the instruments are exposed to the sterilizing action of the released ethylene oxide. A residual quantity of this sterilizing gas remains diffused within the tightly adherent solid polymer film that encapsulates the instruments.

Notes:

1. The use of ethylene oxide as a sterilizing agent is well known. The encapsulation process suggested in this brief is being developed and evaluated. The idea for this process stems from NASA's search for methods of sterilizing and protecting space hardware against micro-organisms. Some degree of success has been achieved in treating uncured polyurethane with ethylene oxide to obtain a sterile polymer for use as a propellant.
2. For further information about this invention inquiries may be directed to:

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Pasadena, California, 91103
Reference: B64-10066

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA Headquarters, Washington, D.C., 20546.

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